

AUSTRALIAN PLANT DISEASE RECORDER

Volume, 10, Number 3

July, 1958

Edited by:

P.G. Valder, Biological Branch,
Department of Agriculture,
Box 36, G.P.O. Sydney.

CONTENTS

<u>PLANT DISEASE NOTES</u>	<u>Page</u>
Cereals and Grasses	24
Field and Fodder Crops.. . . .	
Vegetables	
Fruit	
Miscellaneous	

oOo

For confidential circulation to plant pathologists
in Australia - PLEASE DO NOT ABSTRACT.



PLANT DISEASE NOTESCEREALS AND GRASSESSORGHUM COVERED KERNEL SMUT CONTROL:

Sorghum covered kernel smut disease (Sphacelotheca sorghi (Lk.) Clint.) is readily controlled by a wide range of seed fungicides. Experiments in Queensland over several years have shown that this disease can be prevented by the following fungicides when used at the rate of 2 oz. per bushel:

Copper carbonate; Ceresan; Agrosan; Fernasan; copper oxychloride; captan; Drisan; Premasan; Tetroc; Zehtox; Phygon XL; Bioquin; Betanal.

- T. McKNIGHT

Department of Agriculture and Stock,
TOOWOOMBA.

LEAF GALL ON MICROLAENA STIPOIDES:

A specimen of the grass Microlaena stipoides collected recently at Baulkham Hills showed prominent galls which occurred singly or in clusters on the laminae and leaf bases. The galls varied from translucent green in colour and lens shaped when immature to deep purple and circular with a rugos^e surface at maturity.

The condition has been found to be caused by invasion of the plant by the nematode and Anguina microlaenae (Fawcett) Filipjev. This is the first record of this nematode in New South Wales, but the nematode was originally described from Victoria in 1938 by Fawcett (J. Hel. 16:1:17-32), who distinguished the species on morphological grounds.

This is also the first record of activity of the genus Anguina in recent times in this State. Organoid galls of Anguina agrostis are frequently found admixed with imported Agrostis tenuis seed, and this nematode was found to infect only Lolium rigidum out of 36 grass species tested under glasshouse conditions.

- C.D. BLAKE

N.S.W. Department of Agriculture,
SYDNEY.

FIELD AND FODDER CROPS

A SEED DISORDER OF TICK BEANS:

A common blemish in tick bean seed in Tasmania consists of a necrosis of small areas of the seed coat. In the mature seed this appears as a black spot with or without a completely perforated centre, through which the cotyledons are visible. Unperforated spots may be only $\frac{1}{2}$ mm in diameter, while perforated spots may be 2-3 mm in diameter. When such spots are numerous they may coalesce and the seed coat may be ruptured for a distance of up to 1 cm. In some seed samples 80% or more of seed is affected and no commercial sample examined has been free of the disorder. Samples dating back to 1932 were examined and showed these characteristic symptoms.

The main fungous disease recognised on tick beans at the commencement of the writer's investigations was leaf, stem, and pod spot caused by Ascochyta fabae and the seed disorder was ascribed to it. A. fabae was first recorded in Tasmania in 1947.

The first result of a detailed investigation was the recognition that A. fabae was unimportant as a foliage disease, at least during the past three seasons. A. fabae has been found much more commonly on V. sativa, V. tetrasperma and V. hirsuta. The heavy leaf spotting observed in some tick bean crops was due to a Botrytis sp. similar to that described as B. fabae by Sardina. Infection of the seed with Botrytis is fairly common, the symptoms generally consisting of a circular lesion, reddish brown to yellow in colour, 2-3 mm in diameter and not sunken or perforated.

Attempts to isolate fungi from the perforated seed lesions described above sometimes yielded Botrytis and very infrequently A. fabae, but it became clear that these were only incidental infections. A trial was set out to determine the effects on the disorder of applications of boron and potassium but no significant result was obtained.

The conclusion was reached eventually that the most probable explanation of the disorder was damage by sucking insects. A search was therefore made and on the first visit to a field crop there were observed minute punctures through the walls of the green pods, suggesting the passage of sucking mouthparts. The seed coat of the beans immediately below these punctures were beginning to show signs of necrosis. A further search resulted in the discovery of a very sparse population of bugs actively moving about in the crop and feeding on the pods.

Specimens were collected and indentified by the British Museum as a Colocoris sp.

The first trial conducted by the Entomology Division of feeding bugs on pods in small individual cages reproduced the typical symptoms of the disorder. Whilst it is not certain that this is the only insect capable of producing the disorder, it is clear that it plays an important part.

- I.D. GEARD

Department of Agriculture,
HOBART.

SUSPECTED ZINC DEFICIENCY IN HOPS.

For many years hop growers in Tasmania have complained that a number of their vines were affected by "take-all". Vines with "take-all" produce a much reduced crop or even no crop. In the early part of the season vines are stunted and leaves are a yellowish colour. Later in the season there is generally an improvement in growth. E. Gwenda Cartledge in "An Investigation into the Diseases of Tasmanian Hops" (Tas. Jour. Agric. 27:3: 210-219, 1956) attributed "take-all" to nettlehead virus, the symptoms of both disorders having much in common.

In November last year a grower applied a zinc sulphate spray to some vines with "take-all" symptoms. He left a few weak vines for comparison. By the second week of January the sprayed vines appeared to have responded; the length of internodes was greater, leaves a better size and colour, and there was an improvement in lateral production. At harvest, 50 hops from a sprayed vine weighed 24 gms. and 50 from an unsprayed vine 7.3 g. The zinc content of oven dry leaves from the top of sprayed vines was 50 and 51 p.p.m. Leaves from unsprayed vines contained 8, 11 and 12 p.p.m. zinc. Unsprayed healthy vines contained 48 and 50 p.p.m. zinc.

In another field a four year old planting has developed very poorly. Analyses of leaves from two vines from this planting and from a moderately vigorous vine and a very vigorous vine of the same variety in an adjacent planting, showed zinc contents of 13, 15, 36 and 54 p.p.m. respectively.

These observations indicate that "take-all" may well be caused by zinc deficiency and indicate that maximum production may require a zinc content in the upper leaves of around 50 p.p.m. It is hoped to carry out a planned investigation in the coming season.

- J. R. WARD

Department of Agriculture,
HOBART.

VEGETABLES.POWDERY MILDEW OF BEANS:

During the autumn of 1958, powdery mildew (Oidium sp.) was recorded on French bean crops at Moree. Typical mildew symptoms appeared on the leaves and a reddish-brown discolouration occurred on the pods. This is the first time powdery mildew has been recorded on beans in New South Wales. In America, powdery mildew caused by Erysiphe polygoni is listed as one of the major bean diseases by Zaumeyer and Thomas (U. S. D. A. Tech. Bull. No. 868, 1957). Most probably, the same fungus is concerned here.

- J. WALKER

Department of Agriculture,

SYDNEY.

FRUITADDITIONAL PERITHECIAL HOSTS OF EUTYPA ARMENIACAE:

Isolation of E. armeniacae from severely cankered apple limbs was reported in a previous issue (A.P.D.R. 10:1:15, 1958); up to that time, no perithecial fructifications had been found on the apple host.

In February, 1958, perithecia of E. armeniacae were noted on a dead stub of an apple limb in a garden near Crafers in the Adelaide Hills, and, in April 1958, similar fructifications were found on a dead stub of a walnut limb in the same garden.

In each of these cases, the limb had been cut back several years previously, leaving a stub approximately two inches in diameter, which subsequently had died back for several inches. Both specimens contained viable ascospores and single-spore cultures from these were inoculated to apricot limbs, resulting in positive "gummosis" infections two to three months later.

- M.V. CARTER

Waite Institute

ADELAIDE.

BLACK SPOT CONTROL BY POST-HARVEST ERADICANT SPRAYING:

In A. P. D. R. 10: 2: 21, 1958, it was reported that, at the time of writing, no black spot lesion had been detected in the isolated apple orchard at Maroota, where an experiment in control by eradicant post-harvest spraying has been in progress since 1955.

Since that article was written there has been a change in the situation at Maroota, in that, at the final inspection on 28th May trace infection was detected on late autumn growth on six Granny Smith trees distributed through the block. On each of three of these trees only one infected leaf was detected, but the other three trees each showed a small patch of infection, involving the terminal leaves on a few adjacent shoots. All trees had made extensive autumn growth as a result of the prolonged mild conditions and high moisture status of the soil. Some shoots had ceased growth but many were continuing to grow.

On the three trees each with only one infected leaf, the single lesions occurred on the fourth leaf back from the terminal bud on shoots which had ceased elongating. Similarly, on two of the three trees with a group of infected shoots, one or two lesions occurred on the fourth leaf on shoots which had ceased growth, but numerous lesions occurred on the youngest leaves on the terminals of adjacent shoots which were still growing.

It seems that the older lesions may have resulted from infections in late March, towards the completion of harvesting, and that the younger lesions resulted from infection by conidia splashed from the older lesions in late April. However, on the sixth infected tree the only lesions detected were young ones on a group of three expanding terminals on the outside of the tree, and a thorough search of all surrounding foliage failed to reveal the presence of any older lesion.

There is a possibility that these infections may have occurred during the latter part of the harvest period (harvesting was completed on 1st April) from inoculum introduced into the orchard on second-hand cases. It is most unlikely that the lesions could have resulted as secondary infections from undetected ascospore infections of the spring or summer. Had there been any primary lesions present, extensive secondary infection would be expected to have occurred on these completely unprotected trees during the prolonged wet period through

January, February and March, when 16 inches of rain, spread over 35 days, was recorded at the Maroota orchard.

The orchard was cultivated on March 8th and again on April 8th, and a cover crop of oats was sown on April 23rd. Because of the virtual absence of infection the previous season (Four infected leaves only were detected on late autumn growth and these were removed) and the heavy rains in January, February and March, it seems unlikely that these cultivations could be associated with late release of ascospores.

All 66 Granny Smith tree in this orchard were thoroughly sprayed with 0.05% phenyl mercuric chloride on May 31st. No lesion has been detected on any tree of the other varieties, Willie Sharp and Gravenstein, since the orchard was first sprayed with 0.1% phenyl mercuric acetate in autumn 1955. These latter varieties have received no fungicide for black spot control since then.

- K.E. HUTTON

Department of Agriculture,
SYDNEY.

SOME GRAPEVINE DISORDERS IN N.S.W. DURING 1957-8:Leaf Roll Vines.

A deterioration of vineyards has been going for some years in several parts of New South Wales. The varieties affected are mostly those required for special types of wines and their continuing decline in productivity has caused alarm. The principal factor in this deterioration appears to be the presence of leaf roll virus. The varieties which have been found to be affected to the greatest extent are Chasselas, which appears to be almost 100% infected, Traminer, Montils and some clones of Hunter River Riesling and Pinot. The virus is most prevalent in coastal vineyards and at Corowa, but infection has also been found in Hunter River Riesling and Brown Muscat at Griffith.

Black Measles.

During the past summer, there has been a considerable development of black measles disease in young sultanas in the Coomealla Soldiers' Settlement. In some cases the effect has been so severe that defoliation and die back of canes, and shrivelling and loss of bunches occurred. Symptoms were also seen in Black Shiraz at Coomealla, in Grenache and other varieties at Corowa and in Black Muscat in many parts of the State. A single vine of sultana at Koraleigh treated last winter with sodium arsenate as recommended in California showed no symptoms during the growing season.

Rachitism.

This disease (of unknown cause) was recorded from a number of vineyards during the 1957-8 season. Black Muscat was most commonly affected and reports came from Orchard Hills, Camden, Molong, and the Hunter Valley. This disease is most conspicuous in the early spring, affected canes are retarded and the early formed leaves distorted with leafy outgrowths on the main veins. The first few internodes are short and somewhat flattened and the cane at first tends to grow downward. Not uncommonly the inflorescences on these canes fail to develop, and drop off at an early stage. Usually only a few canes are affected on any vine and growth from other buds is normal, and the later growth of affected canes is normal.

- L.R. FRASER.

MISCELLANEOUSPOWDERY MILDEWS IN SOUTH-EASTERN QUEENSLAND:

During the course of an investigation of powdery mildews in south-eastern Queensland, undertaken during the previous 18 months, mildews were collected on 8 hosts not previously recorded from this area as being subject to mildew attack.

The 8 hosts were Angelonia salicariifolia, Aster subulatus, A. novi-belgii x novae-angliae, Crotolaria incana, Euphorbia hirta, Fumaria officinalis, Hypochaeris microcephala var. albiflora, and Prunus persica. Only the peach and Aster spp. in the above list have previously been recorded in Australia as mildew hosts.

Cleistothecia were not observed on any of these mildews and so positive identification of them was not possible. However it was possible to identify some of them with reasonable confidence on the basis of morphological characters of their imperfect states and host identity. A number of mildew genera and species can be recognised in the conidial state by observing the epiphytic or endophytic nature of the mycelium, the form of appressoria, the presence or absence of well developed fibrosin bodies and whether the conidia are produced in chains maturing in succession from the base of the chain or whether mature conidia are produced singly (or in short chains) and quite distinct in form from the immature conidia beneath them.

The endophytic Crotolaria mildew was distinctive and was identified as Oidiopsis taurica, the imperfect form of Leveillula taurica. This fungus is also found in Queensland on Tropaeolum majus and has been previously recorded as an Oidium sp.

The Aster mildews were amphigenous and the hyphae had unlobed appressoria. The conidia were produced in chains and lacked well developed fibrosin bodies. The fungus appears indistinguishable from the imperfect form of Erysiphe cichoracearum.

The mildews on Angelonia, Euphorbia, and Hypochaeris were similar to the Aster mildew except that they lacked appressoria and contained well-developed fibrosin bodies within their conidia. The three mildews were morphologically indistinguishable from each other and from the local cucurbit mildew Sphaerotheca fuliginea (Clare, 1958, Aust. J. Science, in press).

Sphaerotheca pannosa has been recorded on peach from South Australia. The Queensland peach mildew does not develop the compacted mycelial mats or the very long chains of conidia which are typical of S. pannosa. The local peach mildew with its loose evanescent mycelium and relatively short conidial chains more closely resembles the imperfect state of Podospaera tridactyla, which it is taken to be.

The Fumaria mildew was also amphigenous. Mature conidia were borne solitarily or in short chains on the conidiophores, appressoria were lobed and well developed fibrosin bodies were absent from all parts. The imperfect forms of the Microspheera spp., most of the Uncinula spp. and Erysiphe polygoni (sens.lat.) are of this type.

- B.G. CLARE.

Department of Botany,
University of Queensland,
BRISBANE..

